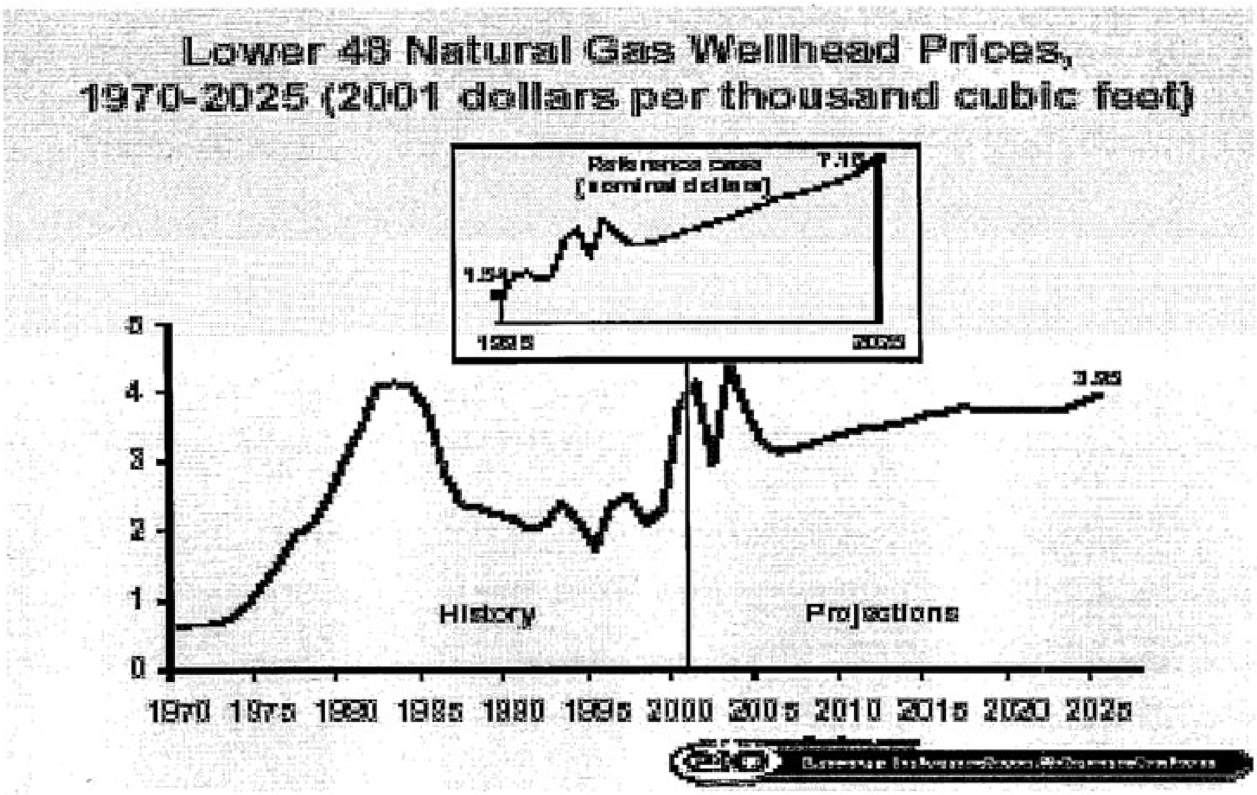
# July 2003 DOE projection: Current high natural gas prices seen as spike, dropping to ~ $3/MMBtu wellhead price by 2006



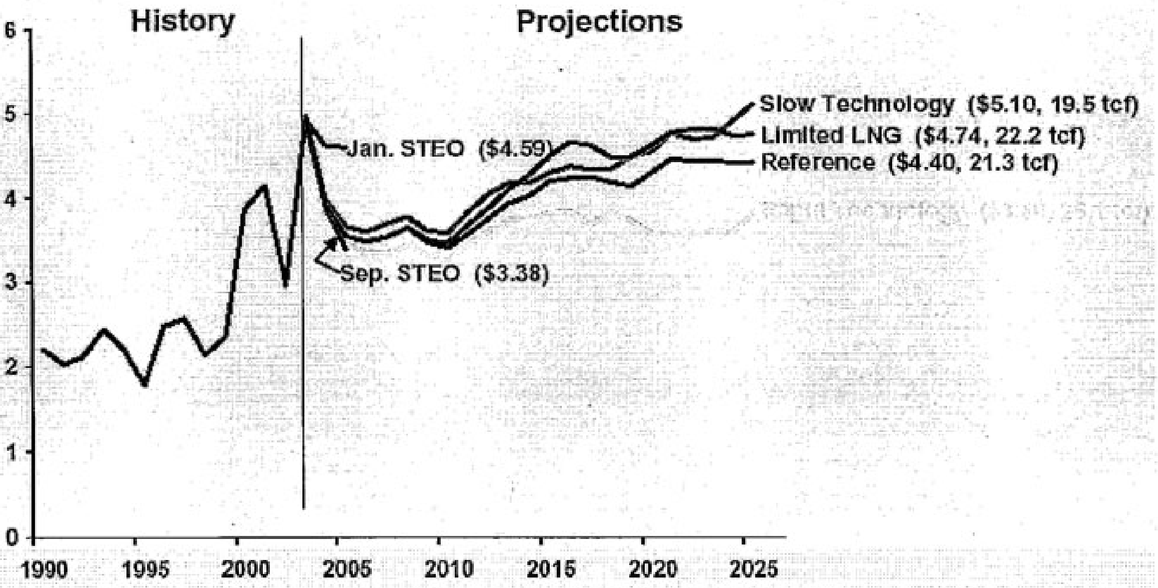



2004/G464

# March 2004 DOE projection: Natural gas price beyond 2013 influenced by pace of technology

From: Dana Van Wagoner, DOE EIA, *Domestic Natural Gas Supply: A Large Resource Base Does Not Guarantee Low Long-Term Prices*, NEMS/AEO Conference, March 23, 2004

Natural Gas Wellhead Prices
(2002 dollars per thousand cubic feet)



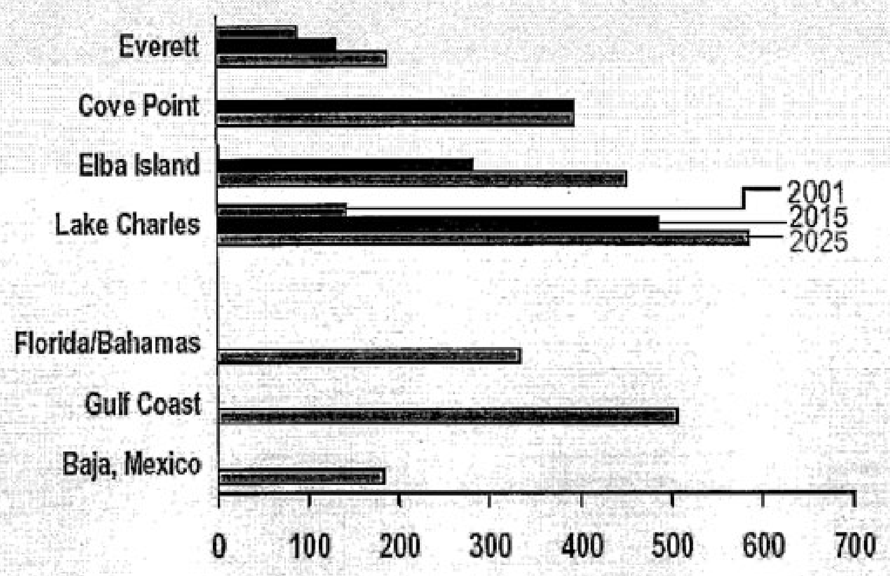

Values in parenthesis = (average lower 48 wellhead price, lower 48 production)



2004/G464

# DOE projects one LNG terminal on West Coast, in Baja California around 2020, in business-as-usual gas usage scenario

LNG Imports by Terminal and/or Region, 2001, 2015, and 2025 (billion cubic feet)

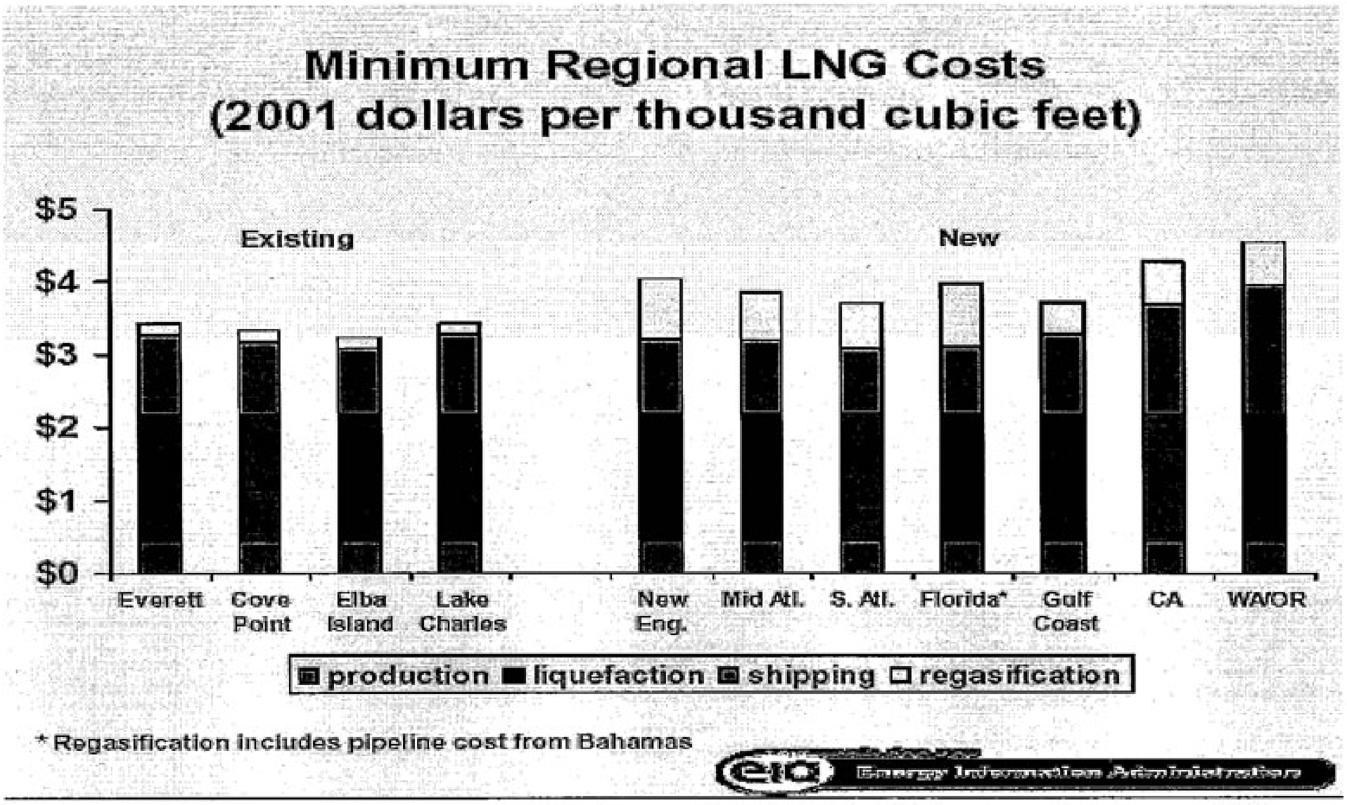



Energy Information Administration



2004/G464

# Reason for no West Coast LNG is high cost relative to domestic gas, only Baja LNG becomes competitive around 2015-2020



# Effect on California Natural Gas Demand

# September 2, 2004 CPUC Decision on Long-Term Natural Gas Procurement

# September 2, 2004 CPUC long-term natural gas procurement decision

- Authorizes Southern California Gas Company to terminate 1,400 mmcfd of firm natural gas capacity rights, the equivalent throughput of two LNG terminals, on domestic pipelines serving California operated by Transwestern and El Paso;
- March 2004 comments to CPUC by Transwestern and El Paso to this plan to terminate domestic natural gas firm (contractually guaranteed) natural gas supply capacity;
- El Paso: *"If utilities decline to hold EPNG capacity now, it may be unavailable to California in the future. Given the Commission's overarching goal of promising price stability and supply diversity/security, the Commission should consider requiring the utilities to continue to hold this capacity as a prudent hedge against an uncertain future."*
- Transwestern: *"Important that utilities not sacrifice long-term supply reliability in the pursuit of supply diversity."*

# SoCalGas voluntary termination of existing domestic gas contracts creates <u>artificial need</u> for new gas capacity in form of LNG

- The CPUC has authorized a course of action that will require SoCalGas to acquire new capacity rights to the equivalent of two LNG terminals; This CPUC action is clearly directed at creating a need for gas capacity where none previously existed to provide access to LNG supplies, as future access to domestic gas capacity via Transwestern and El Paso may be lost due to termination of existing capacity contracts.
- California state government approves and supports the CPUC action to artificially create a demand for LNG - California Resource Agency Asst. Secretary for Energy, Joe Desmond, stated just prior to the CPUC Sept. 2, 2004 decision that California has the need for two LNG terminals[a];
- Kinder Morgan Pipeline Company called for the CPUC to hold evidentiary hearings on LNG in August 2004, given the decision (ultimately adopted without such hearings) is unfavorable to Kinder Morgan's proposal to build a 750 mmcfd pipeline (Silver Canyon Pipeline) from the Rockies to California.
- Two rehearing applications have been filed over the September 2 decision. These rehearing petitions will be heard in January 2005; If the rehearing application(s)s are denied, a lawsuit is the likely next step.

a) Japan Times, *LNG Can Lighten California's Energy Load*, August 7, 2004.

# Non-competitive natural gas trading is issue, not shortage of domestic supply

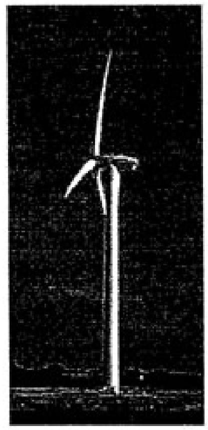
- The wellhead price for U.S. natural gas in 1998 averaged $2/MMBtu[a];
- The wellhead price in 2002 was under $3/MMBtu[a];
- U.S. gas consumption has remained essentially static in the 1998-2004 timeframe (Slide 8);
- In 2004 production is strong relative to consumption and gas storage is at historic high;
- The marginal cost of production for domestic natural gas is well under $3/MMBtu;
- DOE estimates the cost to import LNG to California at over $4/MMBtu (Slide 19);
- LNG supplies will not put downward pressure on natural gas prices in a competitive market;
- Current high natural gas prices appear to be the result of a "badly broken" natural gas trading system[b];
- Substituting higher cost LNG supplies for domestic gas in a non-competitive natural gas market will have no modulating impact on high natual gas prices.

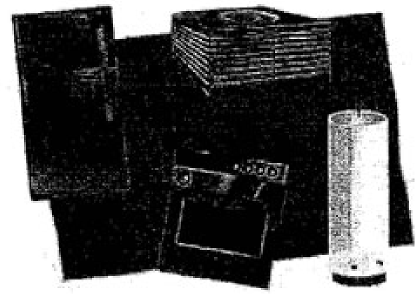
a) DOE EIA U.S. Natural Gas Wellhead Prices ($/Mcf), 1973-2004.
b) Odessa American, *Petrochemical manufacturer Huntsman renews call for natural gas- price probe*, October 28, 2004.

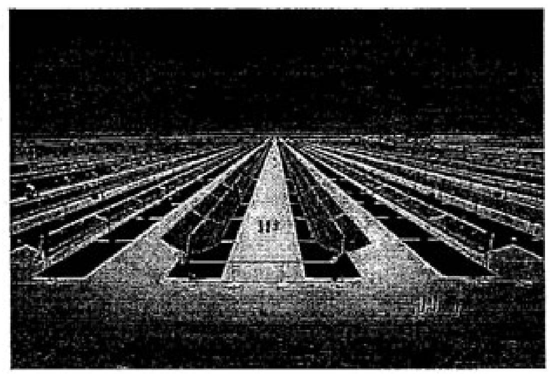
# Accelerated Energy Efficiency and Renewables Alternative to LNG Imports on West Coast

# Aggressive efficiency/renewables is cost-effective alternative to LNG

- Gas demand is static, no growth in 2002-2016,
- Demand and price can be decreased considerably by aggresively implementing energy conservation renewable energy,
- Potential to reduce natural demand by the equivalent of at least 2 LNG terminals,
- Best environmental, fuel price, and public policy.





# California and natural gas needs – Increase supply or decrease demand?

| Gas Demand, Projected Demand Increase, Gas Options | Gas Quantity, mmcfd (million cubic feet per day) |
|---|---|
| Average daily natural gas use in California, 2003 | 6,000 |
| Projected increase in gas demand by 2016 over 2002 baseline | ~0[a] |
| Average projected daily natural gas delivery from one LNG terminal | 700-800 |
| Reduction in California gas demand from conservation measures and renewable energy supplies identified as cost-effective priorities by state | 1,500+[b] |

Note (a): From presentations by CEC, PGE, SoCalGas/SDGE at CEC/CPUC Natural Gas Workshop, Dec. 9-10, 2003. 2006-2016 demand increase in SoCalGas/SDGE territory: 0 mmcfd; in PGE territory: 0-200 mmcfd; CEC statewide: ~0 mmcfd.
Note (b): Derived from Synapse Energy Economics evaluation submitted in March 23, 2004 RACE coalition comments in CPUC Utility Long-Term Natural Gas Procurement Proceeding, Rulemaking 04-01-25 30,000 Gwh of electric power saved through improved energy efficiency; 30,000 Gwh saved through accelerating renewables from 20% to 30% in 2017. 30,000 Gwh ~ equal to gas throughput of one LNG terminal. Assume 8,000 Btu/kwh mean heat rate for electricity production. Additional savings possible through accelerated retirement of coastal utility boiler plants and community choice commitments to 40% RPS by 2017.

# What is the cost of energy options for California?

| Energy Options[a] and 2004 Residential Power Rates | \$/kwh[b] |
|---|---|
| Natural gas combined-cycle power plant (baseload) | 0.05 |
| Natural gas simple cycle power plant (peaking) | 0.16 |
| Wind | 0.05 |
| Solar thermal (parabolic trough) | 0.14 – 0.17 |
| Geothermal (flash) | 0.05 |
| Energy conservation measures[c] | 0.03 – 0.06 |
| San Diego Gas & Electric 2004 residential charge | 0.15[d] |
| CFE, North Baja California 2004 residential charge | 0.22[e] |

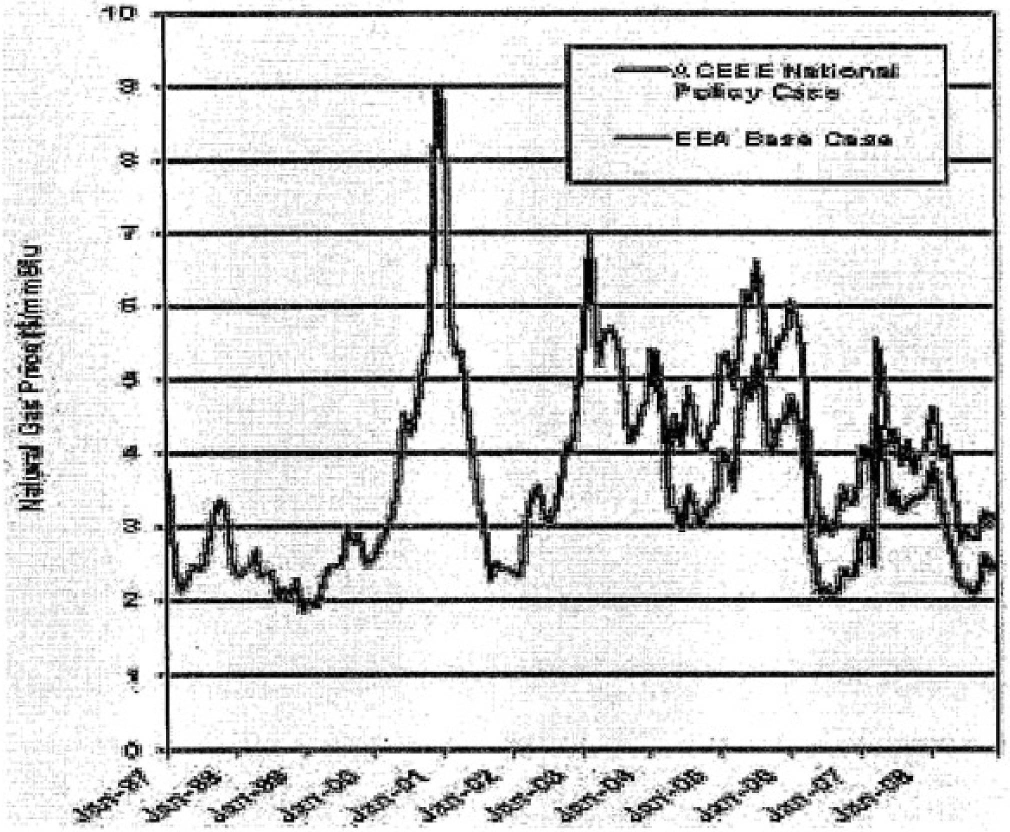
Note (a): California Energy Commission, *Comparative Cost of California Central station Electricity Generation Technologies*, August 2003, pg. 3 and 11.
Note (b): "levelized direct cost" – assumes life-of-project natural gas cost in \$5/MMBtu to \$6/MMBtu range.
Note (c): California Consumer Power and Conservation Financing Authority, "*Clean Growth: Clean Energy for California's Economic Future – Energy Resource Investment Plan*," February 2002, Table 6-2, pg. 54.
Note (d): Includes only metered kwh usage charge and "electric energy charge," April 2004.
Note (e): Includes only December 2003 published CFE summer usage charge based on 1,000 kwh/month.

# Impact of efficiency, community choice, renewables – high renewables % competes well with utility rates

- CA reduced peak electricity demand by 11% in late spring of 2001 and helped break market power;[a]
- Saving peak energy fastest way to reduce gas usage and price - 20% price reduction, $0.90/MMBtu, possible in 12 months;[a]
- Sept 2004: 40 cities/counties seeking to go community choice, 22 have committed to 40% RPS by 2017, other 18 yet to disclose RPS commitment;[b]
- These 22 cities/counties, plus San Francisco, represent ~15-20% of statewide electricity load;
- Sept 2004: Navigant study – even in worst case scenario with H bond direct financing (San Francisco approach), no rate increase with 40% RPS – low cost energy efficiency programs neutralize higher cost of renewables.

a) American Council for an Energy-Efficient Economy, *Impacts of Energy Efficiency and Renewable Energy on Natural Gas Markets*, December 2003.
b) Comments of Paul Fenn, Local Power, summarizing presentations at Law International's *New Directions for California Energy Markets* seminar, Sept. 16-17, 2004, San Francisco.

# ACEEE – National effect of efficiency and renewables on natural gas price



# Gas demand reduction is best public policy approach

- Tremendous public support for renewables;
- Conservation effort in spring 2001 probably most unifying event among CA citizenry in last 25 years;
- The public interest would be best served by decreasing demand aggresively with efficiency and renewables, not increasing supply via LNG;
- Biggest political obstacles to implementing demand reduction policy will be utilities and companies with financial interest in natural gas and LNG supply business.

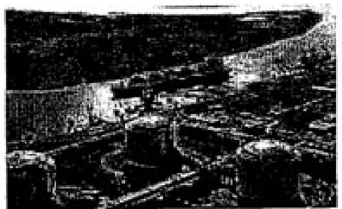
# Sempra's dire forecast [San Diego Union Tribune]

## Company's prediction of a natural-gas crisis is challenged by other energy experts

By Craig D. Rose
STAFF WRITER

October 3, 2004

San Diego-based Sempra Energy has a chilling view of the nation's prospects for producing natural gas, the fuel used to heat a majority of U.S. homes and increasingly used to generate electricity.



Associated Press
The Trunkline LNG terminal in Lake Charles, La., is one of just four operating in the United States. Plans for new terminals – which supporters say will be needed to ensure gas supplies – have sparked opposition from communities around the country.

Within a decade and a half, Sempra says, North America's gas production will soon fall dramatically. That leaves the United States with no course but to build a large network of liquefied natural gas receiving terminals and vastly increase imports of the gas, the company says.

Sempra has used its dire vision to win regulatory backing for its plan to build terminals for LNG, projects opposed by many communities and environmentalists.

Last month, the California Public Utilities Commission voted for the first time to accept gas from an LNG terminal that Sempra proposes to build in Baja California, as well as other terminals planned along the state's coast.

But while most analysts say LNG will play a role in the future, there is no state or federal energy forecast that accepts Sempra's dire view of plummeting gas production.

Forecasts from the Department of Energy and the National Petroleum Council, a broad industry group, predict slight growth – not a decline – in gas production in coming years.

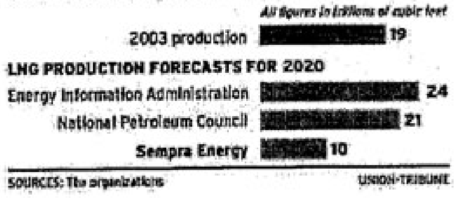
The perspectives are as far apart as the difference between a problem and a crisis.

If Sempra's view is accurate, the United States will be forced to open new lands to natural gas drilling and vastly increase imports, through the use of LNG projects.

If more-optimistic estimates of natural production are accurate, conservation and renewable energy sources could bridge the shortfall.

**Liquefied natural gas production**

Sempra Energy's investment in importing liquefied natural gas is based on its prediction that North American production is about to plummet. But that view isn't shared by the federal government or the industry's National Petroleum Council. Here are forecasts for production from the lower 48 states.




Darcel Hulse, president of Sempra Energy LNG, says renewables and conservation won't be sufficient and adds that the company's forecasts were derived from extensive study.

In a decade and a half, Hulse says, natural gas production will plummet to less than half of current levels.

"There is no way we can reverse the decline," Hulse said.

For Sempra, the solution is unavoidable: Move quickly to bolster gas supplies with LNG. Sempra chief executive Stephen Baum predicts that by 2008, large imports of LNG will begin moderating U.S. natural gas prices, which have risen sharply in recent years.

Bill Powers, a longtime energy industry engineer, takes issue with Sempra's prediction.

Powers, who has been a consultant for government, industry and environmental groups for more than two decades, underscores that other energy forecasters expect gas production to grow in North America, albeit at a modest clip, or remain flat.

LNG development is a choice, not a necessity, he says. He argues that it's not a good choice for California.

"Sempra is trying to create this buzz that we are running out of natural gas and if we don't jump on this LNG train yesterday, we will be in desperate straits," said Powers, chairman of the Border Power Plant Working Group, which advocates for clean energy development along the U.S.-Mexican border. "That's not true."

Powers believes that Sempra's crisis forecast excessively influenced a majority of the California Public Utilities Commission, which voted last month to accept LNG into the state's pipelines.

In discussion leading up to that 3-2 vote, commission members warned of possible gas shortages.

"All experts agree that the current infrastructure and natural supply will be insufficient," PUC Commissioner Susan Kennedy said, before voting to approve LNG shipments. She also urged action to stem rising prices.

## LNG on the West Coast?

**Dozens of liquefied natural gas receiving terminals have been proposed around North America but far fewer are expected to be built. Each terminal, where the liquefied fuel is converted back to a gaseous state, will require about 10 supertankers to keep it supplied.**


SOURCES: Federal Energy Regulatory Commission; ESRI

CHARLOS GARY / Union-Tribune

However, the California Energy Commission forecast late last year that supplies of natural gas will be adequate for the foreseeable future. The state imports 85 percent of its natural gas via conventional pipelines.

Although some outside sources are declining, the energy commission said, growing imports from the Rocky Mountains will offset production declines in California and elsewhere.

That forecast was issued before the PUC voted to require California to derive 20 percent of its electricity from renewable sources by 2010. Dave Maul, who oversees monitoring of natural gas supply and demand at the energy commission, said he expects that commitment to cut the growth in California's demand for natural gas from 1 percent annually to 0.5 percent.

Maul said he is more worried about price than supply.

"I am concerned we will pay more and more for the gas," he said.

Powers argues that LNG imported to the West Coast won't help moderate prices because the long distances required to ship it here – plus processing costs – will likely make LNG more expensive than gas produced in North America.

He also noted that LNG, whose technology is not new, has only become commercially viable because of a doubling in natural gas prices in recent years. While some assert the price increases prove shortages are at hand, others note the natural gas market has also been roiled by price and supply rigging in recent years.

Natural gas is extracted by driving taps into resource basins and funneling the fuel through land-based pipelines. By using LNG technology, the gas can be tapped from foreign fields, supercooled to a highly condensed liquid and imported to North America aboard supertankers.

When the tankers arrive at terminals such as the one Sempra proposes in Baja, the gas is reheated to its gaseous state, processed to ensure compliance with U.S. standards and injected into pipelines, where it becomes indistinguishable from gas from conventional sources.

LNG supporters say it will help diversify U.S. energy sources by increasing supply and transforming gas into a widely traded commodity like oil.

Opponents of the technology don't like all of that picture.

They argue that a growing reliance on LNG will hook the United States on an additional fossil fuel from abroad – just like oil – and squander resources better spent on building national energy independence through conservation and renewable power development.

They also note that much of the gas slated for conversion to LNG will be derived from poorer nations and from pristine natural environments.

Another potential roadblock to LNG development is an ongoing dispute between the PUC and the Federal Energy Regulatory Commission over which agency has jurisdiction to approve siting of the projects. That dispute is now being litigated.

No matter who wins, citizens in most towns are less than happy about the prospect of LNG terminals and tankers moving the highly flammable fuel through their communities. LNG opponents fear accidents and the potential for terrorist attacks.

Supporters say there have been few accidents, although an Algerian liquefaction plant exploded this year, killing 27 people, and an LNG accident in Cleveland in 1944 caused the deaths of 128 people.

More than 30 LNG terminals have been proposed around the country, and in many of the communities stiff opposition has arisen – in some cases causing plans to be scrapped.

Opponents in Long Beach are fighting a proposal to build an LNG terminal there. Another California terminal is proposed about 20 miles off the coast of Ventura County, and a third also is planned nearby off the coast.

So California is central to LNG plans, although no one suspects that all planned facilities will be built here. Donald Felsinger, Sempra's president and chief operating officer, believes that only a handful of all proposals nationwide will result in new LNG plants by the end of the decade.

However, Felsinger also believes that recent action by state regulators was a ratification of his company's LNG advocacy.

"The CPUC vote was a milestone because the utilities came to the conclusion that one of things that would be beneficial for California is to have a diversity of natural gas supply," he said.

The nation's demand for natural gas is rising because, compared with other fossil fuels – oil and gas – it burns cleanest. Increasingly, it is being used to fuel electricity power plants. Nearly all new large California power plants are fueled by natural gas.

Assuming the state has adequate gas supplies without LNG "would be a risky bet," said Sempra's Hulse. "Natural gas shortages would lead to severe shortages for our economy."

He said his company's forecast of a pending steep decline in gas production is shared by other companies investing in LNG. But he acknowledged that Sempra's forecast is far worse than those of the U.S. Department of Energy and the National Petroleum Council.

Still, he said he is comfortable with the company's outlook.

"We don't look at one source. We look at everything," he said. "The chance of us finding a huge new gas supply that would change our production decline is very remote."

The natural gas forecast is based to a large degree on studies of the decline in U.S. oil production, which began in the 1970s, he said.

"In oil we never did make that huge find that reversed our decline and at this level of maturity in our gas production, we don't think we'll find it there, either," he said. "And I think more and more consultants are coming around to our way of thinking."

However, LNG opponents say Sempra's "apocalyptic view" has been too influential and not carefully scrutinized.

Loretta Lynch, a PUC member who opposed Sempra's LNG proposal, said it should be subjected to the commission's "gold standard," evidentiary hearings in which industry executives testify under oath and are subjected to cross-examination.

At the hearings, commissioners could have considered proposals to retrofit older natural-gas-fired power plants with new equipment and cut natural gas demand more than 10 percent, she said.

PUC President Michael Peevey, who voted for LNG entering California, said such a proceeding is unnecessary.

"We've all come to the same conclusion: We need to increase natural gas supply," Peevey said. "I don't think anybody quibbles with that."

However, members of Ratepayers for Clean Affordable Energy, a coalition of environmental and citizens groups, said assertions by Sempra and other industry representatives could be challenged, if made under oath and subject to cross-examination.

"Those gas-crisis scenarios would have been blown away," Powers said.

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